

USATHAMA

U.S. Army Toxic and Hazardous Materials Agency

Enhanced Preliminary Assessment Report:

Plainville Army Housing Units
Plainville, Connecticut

October 1989

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Commander
U.S. Army Toxic and Hazardous Materials Agency
Aberdeen Proving Ground, Maryland 21010-5401

prepared by

Environmental Research Division
Argonne National Laboratory
Argonne, Illinois 60439

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SUMMARY

The Plainville Housing facility located in Plainville, Conn., does not represent any imminent or substantial threat to human health or the environment. There is no evidence to suggest that hazardous or toxic constituents have ever been released from this property. No immediate remedial actions are warranted for the site. Nevertheless, environmental impacts from this property have been identified and some remedial actions are warranted.

Although these housing units were originally developed in support of a Nike missile battery, all available documentation and circumstantial evidence suggest that the housing property was wholly independent of the battery's operational activities. No wastes associated with the operation and maintenance of the missile and tracking systems have ever been delivered to or managed at this housing property. Furthermore, this housing property existed independently of the missile launcher area and integrated fire control portions of the battery with respect to water, sewer, or electrical utilities.

Approximately two years ago, the New York District of the Army Corps of Engineers replaced the original underground fuel storage tanks with 275-gallon above-ground fuel storage tanks. The underground storage tanks remain buried at the rear of the houses and are said to be filled with sand and capped. No document suggests integrity or leak tests were ever taken for these tanks. However, no releases of petroleum products from these tanks are documented or suspected, and the method of abandonment is considered acceptable.

Electrical transformers on the property are maintained by Plainville's power company and there is no evidence of PCB contamination from these transformers.

Finally, it was found during the site visit that a common practice was to leave the spigots to the cement containment troughs around the above-ground tanks in the open position. This was to allow drainage of accumulated rainwater from the troughs. If a spill were to occur, this practice would compromise the effectiveness of the spill-containment trough. In addition, these above-ground tanks had only a primer paint covering at the time of installation. This does not provide adequate protection against adverse weather conditions over an extended period of time.

The following actions are recommended prior to release of this property:

- Coat the existing above-ground tanks with a protective paint to insure extended wear integrity.
- Develop and implement a solution to the possibility of containment-box drainage taps being inadvertently left in the open position.

These recommendations assume that the property will most likely continue to be used for residential housing.

1 INTRODUCTION

In October 1988, Congress passed the Defense Authorization Amendments and Base Closure and Realignment Act, Public Law 100-526. This legislation provided the framework for making decisions about military base closures and realignments. The overall objective of the legislation is to close and realign bases so as to maximize savings without impairing the Army's overall military mission. In December 1988, the Defense Secretary's ad hoc Commission on Base Realignment and Closure issued its final report nominating candidate installations. The Commission's recommendations, subsequently approved by Congress, affect 111 Army installations, of which 81 are to be closed. Among the affected installations are 53 military housing areas, including the Plainville housing area addressed in this preliminary assessment.¹

Legislative directives require that all base closures and realignments be performed in accordance with applicable provisions of the National Environmental Policy Act (NEPA). As a result, NEPA documentation is being prepared for all properties scheduled to be closed or realigned. The newly formed Base Closure Division of the U.S. Army Toxic and Hazardous Materials Agency is responsible for supervising the preliminary assessment effort for all affected properties. These USATHAMA assessments will subsequently be incorporated into the NEPA documentation being prepared for the properties.

This document is a report of the enhanced preliminary assessment (PA) conducted by Argonne National Laboratory (ANL) at the Army stand-alone housing area in Plainville, Conn.

1.1 AUTHORITY FOR THE PA

The USATHAMA has engaged ANL to support the Base Closure Program by assessing the environmental quality of the installations proposed for closure or realignment. Preliminary assessments are being conducted under the authority of the Defense Department's Installation Restoration Program (IRP); the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Public Law 91-510, also known as Superfund; the Superfund Amendments and Reauthorization Act of 1986, Public Law 99-499; and the Defense Authorization Amendments and Base Closure and Realignment Act of 1988, Public Law 100-526.

In conducting preliminary assessments, ANL has followed the methodologies and procedures outlined in Phase I of the IRP. Consequently, this PA addresses all documented or suspected incidents of actual or potential release of hazardous or toxic constituents to the environment.

In addition, this PA is "enhanced" to cover topics not normally addressed in a Phase I preliminary assessment. Specifically, this assessment considers and evaluates the following topical areas and issues:

- Status with respect to regulatory compliance,
- Asbestos,
- Polychlorinated biphenyls (PCBs),
- Radon hazards (to be assessed and reported on independently),
- Underground storage tanks,
- Current or potential restraints on facility utilization,
- Environmental issues requiring resolution,
- Health-risk perspectives associated with residential land use, and
- Other environmental concerns that might present impediments to the expeditious "excessing," or transfer and/or release, of federally owned property.

1.2 OBJECTIVES

This enhanced PA is based on existing information from Army housing records of initial property acquisition, initial construction, and major renovations and remodeling performed by local contractors or by the Army Corps of Engineers. The PA effort does not include the generation of new data. The objectives of the PA include:

- Identifying and characterizing all environmentally significant operations (ESOs),
- Identifying property areas or ESOs that may require a site investigation,
- Identifying ESOs or areas of environmental contamination that may require immediate remedial action,
- Identifying other actions that may be necessary to address and resolve all identified environmental problems, and
- Identifying other environmental concerns that may present impediments to the expeditious transfer of this property.

1.3 PROCEDURES

The PA began with a review of Army Housing records located at Fort Devens, Mass., during the week of May 15-19, 1989. Additional information was obtained from conversations with personnel from the Connecticut Housing Office in New Haven, Conn., on July 17. A site visit was conducted at Plainville, Conn., on July 19, 1989, at which time additional information was obtained through personal observations of ANL investigators. Photographs were taken of the housing units and surrounding properties as a means of documenting the condition of the housing units and immediate land uses. Site photographs are appended.

All available information was evaluated with respect to actual or potential releases to air, soil, and surface and ground waters.

Access to individual housing units was not available during the site visit. However, ANL investigators revisited the property on September 12, 1989, at which time the interiors of all but six of the units (units #4, 11, 21, 25, 27, and 29, on Cassidy Drive) were inspected.

2 PROPERTY CHARACTERIZATION

2.1 GENERAL PROPERTY INFORMATION

The Plainville housing units are located in central Connecticut, in the town of Plainville, County of Hartford. The entire property is 9.0 acres with surrounding woodland on its borders.² Figures 1 and 2 show the general location of the facility. The housing units were developed in 1958.

2.2 DESCRIPTION OF FACILITY

Figure 3 presents the site plan of the housing property.

Housing Units

The Plainville housing area consists of 32 "Capehart"-style houses; 30 houses have three bedrooms and two have two bedrooms. Ten units have an attached garage, and one has a detached garage. Capehart is the model name assigned to these houses by the builder, National Homes. The houses are built on concrete slabs with no structures underground. Water lines are embedded into the foundation slab. Heating lines and air conditioning ducts, which were also originally embedded in the foundation slabs, were moved to the ceiling approximately two years ago when the Army Corps of Engineers renovated the heat system. Original heating ducts were abandoned in place.

Utilities

Since development of the property, the housing units have been supplied with city water, and no drinking water wells exist on the property. The property is connected to city power and all telephone poles and electrical transformers on site are the responsibility of Plainville's power company. No problems associated with the electrical transformers have been documented. Solid wastes are removed from the site by a private contractor.

Sewage

The housing units are connected to city sewers.

Fuel Storage

The original 275-gallon underground fuel storage tanks installed in 1958 were replaced approximately two years ago with 275-gallon above-ground tanks. The New York District Army Corps of Engineers conducted the tank renovations and filled the underground storage tanks with sand. These are located at the rear of each housing

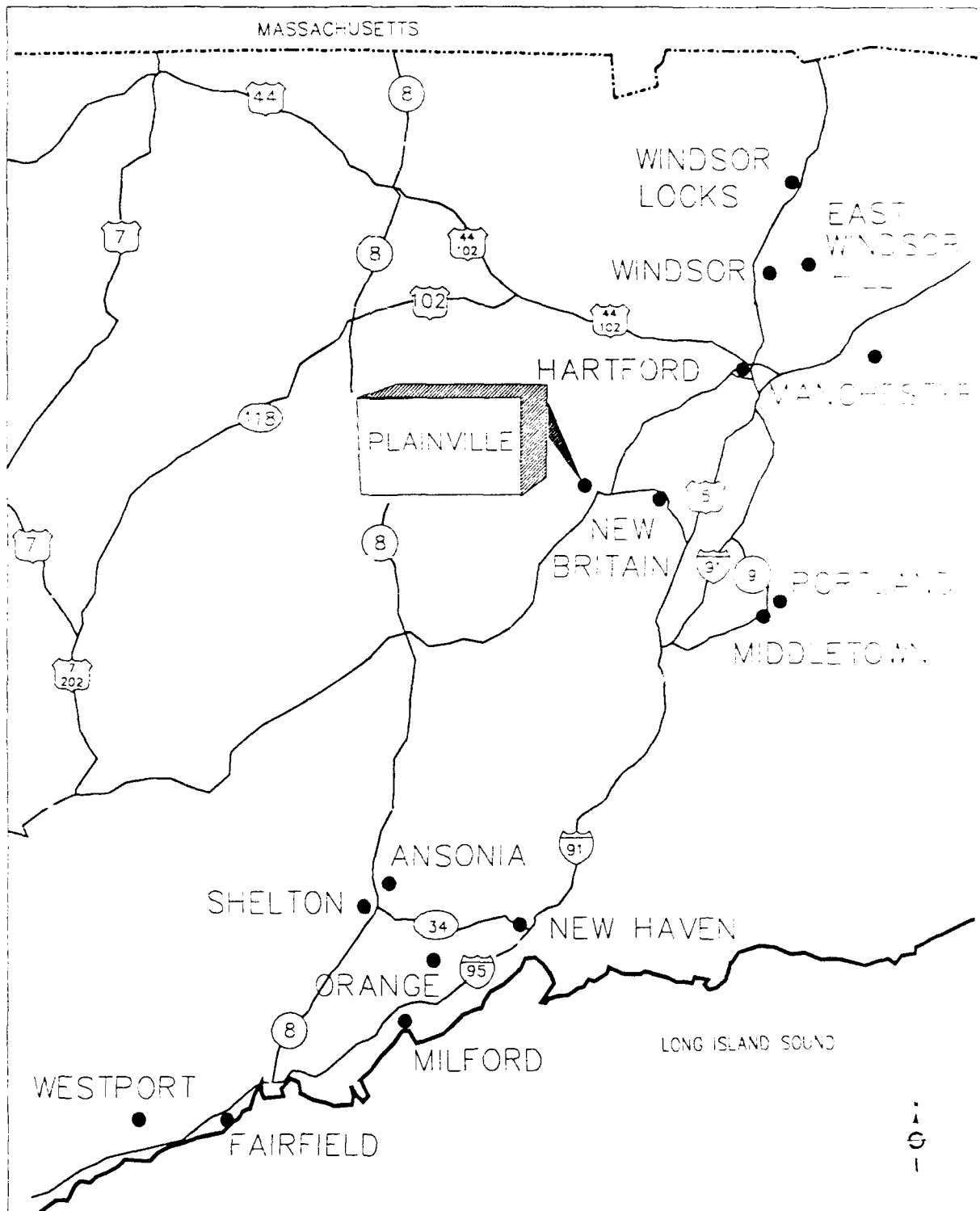


FIGURE 1 Location Map of Connecticut Army Housing Facilities

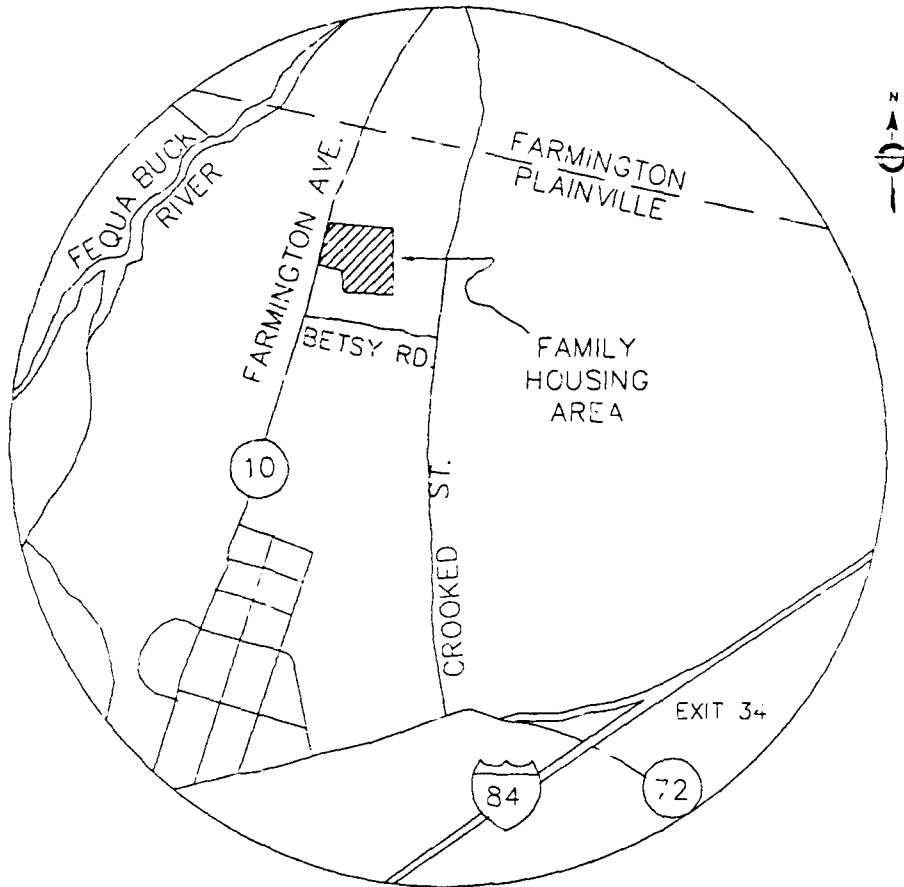


FIGURE 2 Vicinity Map of Plainville Army Housing Units

unit. No leaks were documented or suspected for the underground tanks. Instead, their replacement was a matter of good engineering practice, dictated by the advancing ages of the tanks.

Storm Drainage Systems

The housing units are connected to city storm drainage through a system of strategically located catch basins.

Other Permanent Structures or Property Improvements

No other permanent structures or improvements exist.

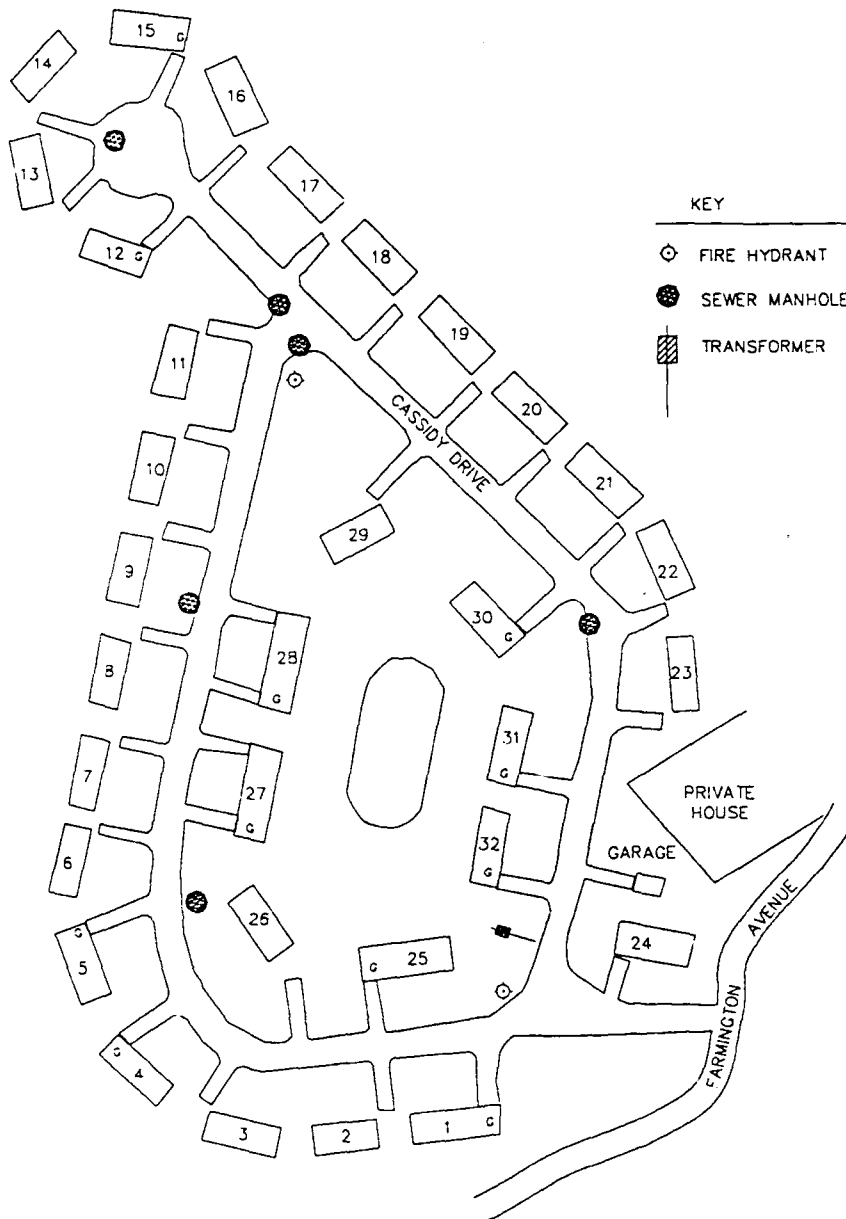


FIGURE 3 Site Plan Map of Plainville Army Housing Units

2.3 PROPERTY HISTORY

2.3.1 Nike Defense Program and Typical Battery-Level Practices

Generic information on the national Nike antiaircraft defense program has been compiled in two studies, one commissioned by the Army Corps of Engineers³ and the other by the U.S. Army Toxic and Hazardous Materials Agency.⁴ In both studies, independent contractors relied on information contained in unclassified documents related to the Nike surface-to-air missile program, including engineering drawings and

specifications (for the facilities and the missiles themselves), interviews with Army personnel participating in the Nike program, and operations manuals and directives relating to the operations and maintenance of Nike facilities. Taken together, these two reports represent the most complete assemblage of generic information on the Nike missile program from an environmental perspective. Salient points from both reports are condensed below.

At its zenith in the early 1960s, the Nike program included 291 batteries located throughout the continental United States. The program was completely phased out by 1976, with many of the properties sold to private concerns or excessed to state or local governments for nominal fees.

Nike Ajax missiles were first deployed in 1954 at installations throughout the continental United States, replacing, or in some cases augmenting, conventional artillery batteries and providing protection from aerial attack for strategic resources and population centers. Typically, Nike batteries were located in rural areas encircling the protected area. The Ajax was a two-stage missile using a solid-fuel booster rocket and a liquid-fuel sustainer motor to deliver a warhead to airborne targets.

The Ajax missile was gradually replaced by the Nike Hercules missile, introduced in 1958. Like the Ajax, the Hercules was a two-stage missile, but it differed from the Ajax in that its second stage was a solid-fuel rather than liquid-fuel power source and its payload often was a nuclear rather than conventional warhead. Ajax-to-Hercules conversions occurred between 1958 and 1961 and required little change in existing Nike battery facilities. A third-generation missile, the Zeus, was phased out during development and consequently was never deployed.

A typical Nike missile battery consisted of two distinct and separate operating units, the launch operations and the integrated fire control (IFC) operations. The two operating areas were separated by distances of less than two miles, with lines of sight between them for communications purposes. A third separate area was also sometimes part of the battery. This area was typically equidistant from the two battery operating sites and contained housing for married personnel assigned to the battery. Occasionally, these housing areas also contained battalion headquarters, which were responsible for a number of Nike batteries.

Depending on area characteristics and convenience, the housing areas were often reliant on the launch or IFC sites for utilities such as potable water, electrical power, and sewage treatment. In those instances, buried utility lines connected the housing area to one or both of the other battery properties. It is also possible, however, that housing areas were completely independent of the missile launcher and tracking operations. In those instances, the necessary utilities were either maintained on the housing site or purchased from the local community. In many localities, as the character of the land area around the housing units changed from rural to suburban or urban, communities extended utility services to the housing unit locations, in which case conversions from independent systems to community systems were made.

A large variety of wastes was associated with the operation and maintenance of Nike missile batteries. Normally encountered wastes included benzene, carbon

tetrachloride, chromium and lead (contained in paints and protective coatings), petroleum hydrocarbons, perchloroethylene, toluene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, and trichloroethylene. Because of the rural locations of these batteries, and also because very few regulatory controls existed at that time, most of these wastes were managed "on-site." (Unused rocket propellants and explosives, however, would always have been returned to central supply depots and not disposed of on-site.) It is further conceivable that wastes generated at one of the Nike properties may have been transferred to its companion property for management or disposal.

Wastes related to missile operation and maintenance would not have been purposely transferred from a battery operating area to a housing area with no facilities for waste management or disposal. In some instances, however, the sewage treatment facilities for all Nike battery properties were located at the housing area; that possibility cannot be automatically ignored. Finally, where housing areas received various utilities from either of the operating areas, it is also possible that wastes disposed of on those other properties may have migrated to the housing area via the buried utility lines. And since decommissioning of the Nike batteries did not normally involve removal of buried utility or communication lines, any such contaminant migration is likely to have gone unnoticed.

2.3.2 Plainville Housing Units

The Plainville housing area was first built in 1958 as a stand-alone housing facility for military personnel assigned to the Plainville Nike battery. Thirty-two single family houses were erected on the property. Since the initial property development in 1958, no other permanent structures have been added. The units have been used to house active duty military personnel and their dependents since the Nike battery's decommissioning in the early 1970s.

Since the initial property development in 1958, no other permanent structures have been added.

2.4 ENVIRONMENTAL SETTING AND SURROUNDING LAND USE

The surrounding land use is residential. The housing area is on higher ground than all immediately adjacent properties. The town of Plainville has a 1984 population estimate of 16,000.⁵

2.5 GEOLOGIC AND HYDROLOGIC SETTINGS

Plainville is located in the lower Quinnipiac River Basin of the New England Upland section of the New England Physiographic Province. The Quinnipiac River Basin area in south-central Connecticut covers 362 square miles, and includes all drainage basins that enter Long Island Sound from the Branford to the Wepawaug Rivers. Precipitation averages 47 inches per year and provides an abundant supply of water; 21 inches return to the atmosphere as evapotranspiration, the remainder flows directly to

streams or percolates to the water table or discharges to Long Island Sound. Small amounts of water are exported from the basin by the New Britain Water Department; small amounts of water are imported to the basin by the New Haven Water Company.

The average annual runoff of 164 billion gallons represents the amount of water potentially available in the area over the long term, but only part of it is presently utilized. Data for 1970 show that only 22% was actually used during that year. Some industries along the Quinnipiac River reuse water; if industrial development continues, reuse will increase.

Stratified drift is the only aquifer capable of large sustained yields of water to individual wells. Yields of 64 screened wells tapping stratified drift range from 17 to 2,000 gallons per minute (gal/min); their median yield is 500 gal/min.⁶

Till is widespread and generally provides only small amounts of water. Wells in till normally yield only a few hundred gallons of water daily and commonly are inadequate during dry periods. Till is generally used only as an emergency or secondary source of water.

Bedrock aquifers underlie the entire report area and include sedimentary, igneous, and metamorphic rock types. These aquifers supply small but reliable quantities of water to wells throughout the basin and are the chief source for many nonurban homes and farms. About 90% of the wells tapping bedrock yield at least 2 gal/min, and much larger yields are occasionally reported. Maximum well yields of 305 gal/min for sedimentary, 75 gal/min for igneous, and 200 gal/min for metamorphic bedrock have been reported.

The natural quality of water in the area is good. The water is generally low in dissolved solids and is soft to moderately hard. Surface water is less mineralized than groundwater, especially during high flow when it is primarily surface runoff. Iron and manganese occur in objectionable concentrations in parts of the basin, particularly in water from streams draining swamps and in water from aquifers rich in iron- and manganese-bearing minerals.

Human activities have modified the quality of water in much of the basin. Wide and erratic fluctuations in concentration of dissolved solids in streams, high bacterial content of the Quinnipiac River, and locally high nitrate and chloride concentrations in groundwater are evidence of man's influence. Streams, wetlands, and some aquifers along the southern boundary of the basin contain salty water. Overpumping has caused extensive saltwater intrusion in aquifers in the southern and eastern parts of New Haven.

The total amount of fresh water used in the area during 1970 is estimated at 35,710 million gallons, or 183 gallons per day per capita. Public water-supply systems met the domestic requirements of about 90% of the population; all the systems supplied water that met the drinking water standards of the Connecticut Department of Health.⁶

3 ENVIRONMENTALLY SIGNIFICANT OPERATIONS

3.1 UNDERGROUND STORAGE TANKS

Each unit has a 275-gallon underground fuel tank in back of the house. These tanks are no longer in use. The New York District of the Army Corps of Engineers drained and filled these tanks with inert material and had them capped-off in 1987. Above-ground fuel storage tanks with a capacity of 275 gallons are currently in use behind each house. No documentation was found to indicate failures or suspected leaks at any of the underground tanks. Instead, these tank replacements are reported to have occurred as a result of good engineering practice, dictated by the advancing ages of the underground tanks.

3.2 ABOVE-GROUND TANKS

The above-ground tanks have only a primer paint to cover them, and a make-shift shelter attached to the house a few feet above the tanks. This does not offer adequate protection to the tanks against adverse weather conditions. Areas of rust and corrosion were observed on some of the tanks.

It is common practice for the residents of the housing area to leave the spigots open which drain the cement troughs around the above-ground tanks. This is to allow the rainwater which collects in these tanks to drain away. Residents store garbage cans, lawn chairs, and miscellaneous supplies in this trough area. If these spigots are left open routinely, the effectiveness of the cement troughs as spill-containment devices would be compromised. No such incident has occurred, however.

3.3 ASBESTOS CONSTRUCTION MATERIALS

Floor tiles installed during original construction may contain asbestos. However, these tiles were all found to be in good condition.

4 KNOWN AND SUSPECTED RELEASES

No major releases or impacts to the environment are known to have occurred at Plainville. No hazardous wastes or hazardous materials are stored on-site.

The original underground storage tanks remain buried behind each house. These tanks are believed to have been installed with no cathodic protection or other protective coatings; however, no evidence of leaks or releases from these tanks has been found.

5 PRELIMINARY ASSESSMENT CONCLUSIONS

Although these housing units were originally developed in support of a Nike missile battery, all available documentation and circumstantial evidence indicate the fully independent operation of this housing property from other Nike battery activities. No Nike-related wastes were delivered to this property for management or disposal. Furthermore, since this property was independent of the Nike missile operations with respect to all necessary utilities, there is no possibility of Nike-related wastes migrating along buried utility lines.

No records indicate a problem with PCB-related contamination at this site. The local power company maintains the electrical transformers, and no evidence of spills or leaks from these transformers was found.

The original underground heating oil tanks installed at each unit are no longer in service, but have not been removed. No records were found indicating that any leak tests or soil tests have been conducted around these tanks. None of these tanks has cathodic protection or other protective coatings. The topography of the property frequently results in saturated soil conditions, which would promote deterioration of these tanks. However, no releases of petroleum products are documented or suspected from these tanks, and the method of abandonment of these tanks is generally considered to be acceptable.

Although the above-ground tanks were installed with a cement containment trough around them, the effectiveness of containing a possible oil spill is compromised with the common practice of leaving the spigots to the troughs left in the open position. These tanks were installed with only a primer paint coating, which does not allow adequate protection from adverse weather conditions over an extended period of time. Some corrosion was observed.

6 RECOMMENDATIONS

The Plainville housing facility does not represent any imminent or substantial threat to human health or the environment. There is no evidence to suggest that hazardous or toxic constituents have ever been released from this property. No immediate remedial actions are warranted for this site.

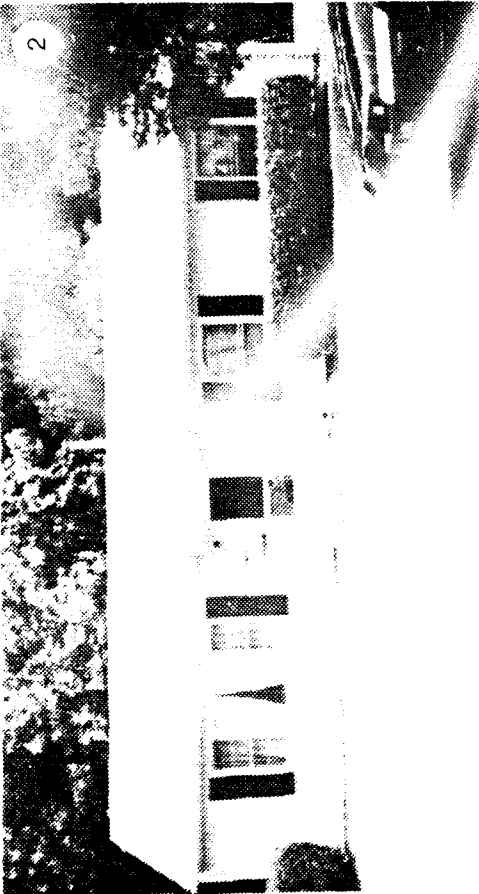
One potential environmental impact derives from the continued use of the inadequately protected above-ground fuel-oil storage tanks and their associated concrete containment boxes. The integrity of these relatively new storage tanks should be confirmed, and, following treatment for existing rust, protective coatings should be applied to the exteriors of the tanks. With respect to containment-box drainage taps, a method should be devised to ensure that they do not remain in the open position for extended periods of time.

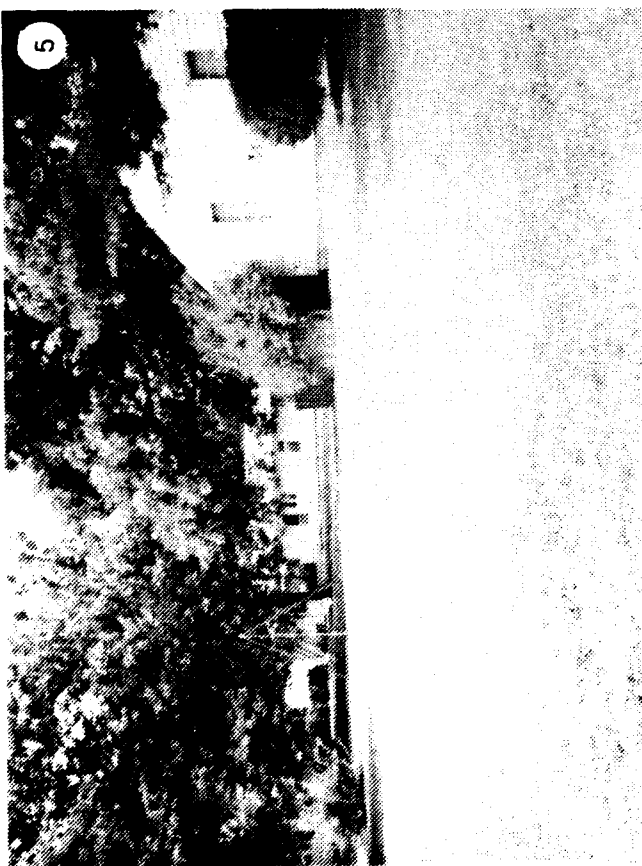
These recommendations assume that this property will continue to be used for residential housing.

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APPENDIX:
PHOTOGRAPHS OF PLAINVILLE HOUSING FACILITY
AND SURROUNDING LAND





IDENTIFICATIONS OF PHOTOGRAPHS

1. A general view of one section of the housing area; a fire hydrant and grated cover of the storm sewer system (lower center) can be seen.
2. Front view of a Capehart house.
3. Side view of another housing unit with a detached garage.
4. Another housing unit, *this one with an attached garage (top right)*.
5. A playground, with houses on two sides.
6. Above-ground fuel-oil storage tank, concrete containment box, and protective canopy over the tank, at the rear of a housing unit.
7. A close-up view of the oil-storage tank; drain tap for the concrete box is located just above the ground on concrete slab at right; if drain tap is left in the open position, any oil leak would not be contained inside the box, but instead would spill to the surrounding ground.